

In the Claims

This listing of claims will replace all prior versions and listings of claims in the application:

- 1 1. (Original) A method of performing a dot product operation
2 with rounding and shifting in a microprocessor in response to a
3 single rounding dot product instruction, the method comprising the
4 steps of:
5 fetching a first pair of elements and a second pair of
6 elements;
7 forming a first product of the first pair of elements and a
8 second product of the second pair of elements;
9 combining the first product with the second product to form a
10 combined product; X
11 rounding the combined product to form an intermediate result;
12 and
13 shifting the intermediate result a selected amount to form a
14 final result.

B1
2. (Cancelled)

- 1 3. (Currently Amended) The method of Claim 2 1, wherein the
2 step of rounding adds a rounding value to the combined product via
3 an arithmetic circuit having a first input receiving said first
4 product, a second input receiving said second product and a carry
5 input to a mid-position receiving said rounding value to form the
6 intermediate result, and wherein the step of shifting shifts the
7 intermediate result right by a selected shift amount. ✓

- 1 4. (Currently Amended) The method of Claim 3, wherein the
2 rounding value is 2^{**n} 2^n and the selected shift amount is n+1.

1 5. (Original) The method of Claim 4, wherein n has a fixed
2 value of fifteen.

Claims 6 to 8. (Canceled)

1 9. (Original) The method of Claim 1, wherein the step of
2 forming treats a one of the first pair of elements as a signed
3 number value and treats another one of the first pair of elements ✓
4 as an unsigned number value.

1 10. (Original) The method of Claim 1, wherein the step of
2 combining comprises subtracting the product of second pair of ✗
3 elements from the product of first pair of elements.

1 11. (Original) The method of Claim 1, wherein the step of
2 combining comprises adding the product of second pair of elements ✗
3 to the product of first pair of elements.

B1
12. (Canceled)

1 13. (Original) A digital system having a microprocessor
2 operable to execute a rounding dot product instruction, wherein the
3 microprocessor comprises:

4 storage circuitry for holding pairs of elements;
5 a multiply circuit connected to receive a first number of
6 pairs of elements from the storage circuitry in a first execution
7 phase of the microprocessor responsive to the dot product
8 instruction, the multiply circuit comprising a plurality of
9 multipliers equal to the first number of pairs of elements;

10 an arithmetic circuit connected to receive a plurality of
11 products from the plurality of multipliers, the arithmetic circuit
12 having a provision for mid-position rounding responsive to the

13 rounding dot product instruction; and
14 a shifter connected to receive an output of the arithmetic
15 circuit, the shifter operable to shift a selected amount in
16 response to the rounding dot product instructions.

1 14. (Original) The digital system of Claim 13, wherein the
2 arithmetic circuit has a carry input connected to a mid-position,
3 wherein the carry input is asserted in response to the rounding dot
4 product instruction.

1 15. (Original) The digital system according to Claim 1 being
2 a cellular telephone, further comprising:

3 an integrated keyboard connected to the processor via a
4 keyboard adapter;
5 a display, connected to the processor via a display adapter;
6 radio frequency (RF) circuitry connected to the processor; and
7 an aerial connected to the RF circuitry.

1 16. (New) The method of Claim 3, wherein:

2 the step of shifting sign extends the intermediate result.

112

1 17. (New) The digital system of Claim 13, wherein:
2 the shifter right shifts and sign extends the output of the
3 arithmetic circuit.